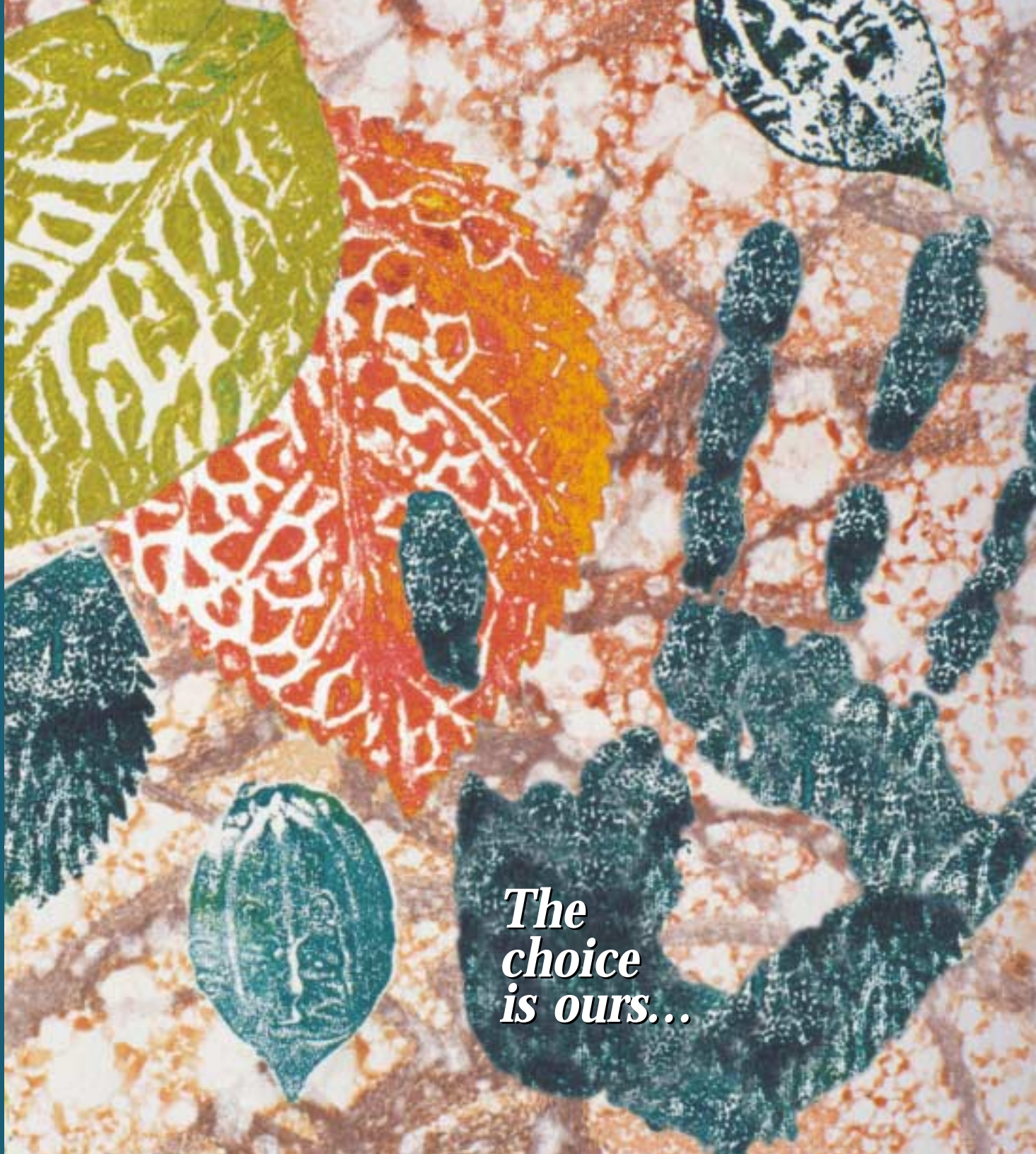


Maine's
Environment
2002

*The
choice
is ours...*





Introduction

We have been protecting Maine's environment for 30 years, and our actions and approach have evolved along the way. In the 1970s, our environment was in serious trouble. We, as citizens, demanded that government work to clean up and regulate rampant air and water quality problems, and to end dangerous waste disposal practices. Government developed a regulatory framework and pushed on industry to comply. Our role as citizens adapted to that of observer and assessor, making sure those responsible for problems were identified and cleaned them up.

Those dynamics changed in the 1990s. The regulatory framework was strengthened and expanded, but within it government and industry sought the mutual benefits of collaboration. Government not only enforced environmental standards but provided technical assistance to help businesses comply.

Sustainability

*means meeting the
needs of the present
without compromising
the ability of future
generations to meet
their own needs.*

Both of these phases have been important not only in cleaning up the environment, but building the capacity and infrastructure to move forward and tackle more complex issues.

But now a new approach is needed. The big fixes are largely done and the environmental issues we face today are more complex and difficult to regulate. Often when we engineer a solution for one resource, we inadvertently pollute another resource. Today's environmental issues increasingly come down to individual choice, as we citizens are the source of some of our major environmental problems.

In this next phase of environmental progress, historical responsibilities for enforcement and compliance remain. However, re-energized citizen involvement will foster sustainability in the years ahead.

We need to make choices as we move to the next phase of environmental protection. This document lays out those choices. It tracks our progress to improve Maine's environment and challenges us to examine our daily lives and engineer our future.

Environmental Regulation

Since 1970, Maine has been regulating and cleaning up industrial discharges and point sources. Building off a framework of federal laws, we have come a long way. Our lakes are cleaner, the osprey and bald eagle have returned, rivers have been reclaimed, and noxious factory fumes no longer peel the paint off homes downwind.

Listed here are just a few of the milestones that track our increasing sophistication at managing environmental problems. They illustrate the legal framework for dealing with major issues and sources of pollution. The long list also shows our resolve for addressing new issues and threats as we become aware of them.

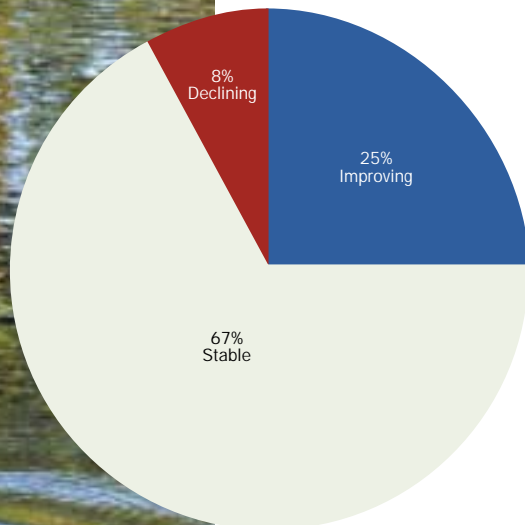


Milestones

- 1970 Maine passes the Site Location of Development Law to regulate large developments.
- 1971 Shoreland Zoning is enacted to regulate land use and development close to lakes, ponds, rivers, and tidal waters.
- 1972 Department of Environmental Protection is established.
- 1979 Maine passes its Hazardous Waste, Septage and Solid Waste Management Act tailoring federal requirements to Maine's environment and strong reliance on groundwater.
- 1983 Maine Rivers Act classifies rivers and sets allowable activities for each category.
- 1987 Solid Waste Management, Recycling and Landfill Closure Assistance Act requires planning effort and set statewide recycling goals and incentives.
- 1988 Natural Resources Protection Act (NRPA) consolidates the protection of natural features of Maine's environment.
- 1990 Toxics Use Reduction Law is enacted, setting reduction goals and requirements for hazardous and toxic chemicals. This law was reauthorized in 1999.
- 1991 Nonpoint Source Water Pollution Management Program was enacted, then expanded in 1998 to cover existing sources.
- 1993 The Voluntary Response Action Program focuses Maine's effort to spur remediation, clean-up, and re-use of industrial sites or "brownfields".
- 1997 Erosion and Sedimentation Control Law required basic measures to prevent soil erosion and sedimentation.
- 1998 A landmark Mercury Law is passed to monitor ambient levels and work to remove mercury from products.



Water Quality

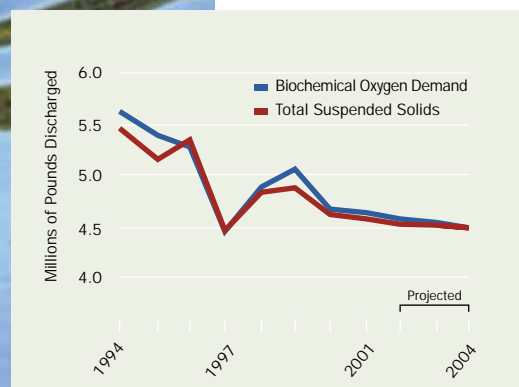


Water quality is stable or improving in Maine lakes

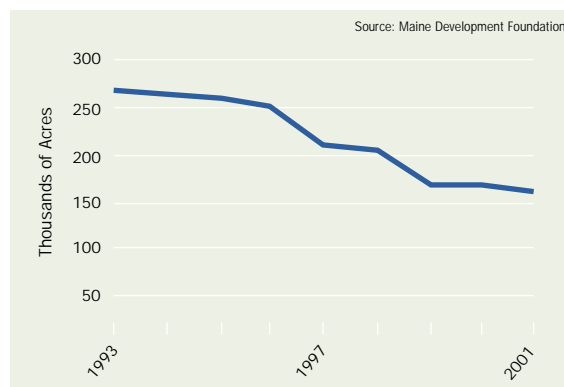
Maine's history is tied to clean and abundant rivers, lakes, and shorelines. Thirty-five years ago, our rivers stank and fish kills were common. We have spent considerable money and effort to improve them; the results are telling.

Water Quality trends for 224 Maine lakes that have been tracked for at least 8 years show that 67% of those lakes have stable water quality, 25% are improving, and only 8% are declining. Maine's major rivers and streams also are improving with 70% of their length fishable and 94% of their length swimmable.

Society is releasing less pollution to the environment. Sewage treatment plant discharges in terms of the amount of total suspended solids and biochemical oxygen demand are down 20% in the past 8 years. This decrease means that Maine's rivers can reclaim their integrity and allows us to expand how we use our rivers.



Sewage effluent discharged to Maine rivers has decreased by 20%



Less acreage is closed to shellfish harvesting

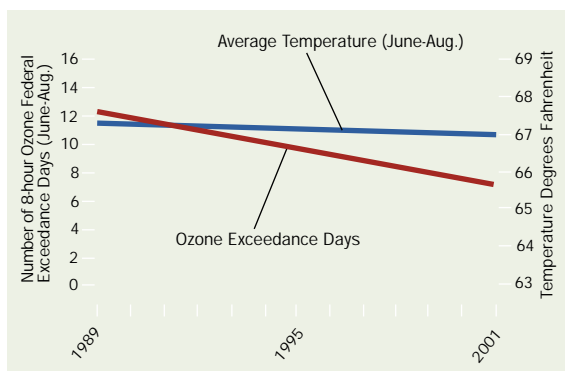
More acreage open to shellfish harvesting illustrates improving marine water quality, important not only for commercial fishing but also as an indicator of ecological improvements. Sewage discharges from malfunctioning septic systems, straight discharge pipes, and non-point source pollution are responsible for closing shellfish areas to harvesting. Over 500 residential and commercial discharges to coastal waters have been removed since 1995.

Although there are warnings for fish consumption throughout the US, the emission of mercury into the environment is decreasing. The bad news is that once mercury is in the environment it is very persistent and does not break down. PCBs and dioxin in fish tissue samples from Maine rivers have also decreased, but the toxicity of these chemicals is very high.

To improve water quality, we have focused on point sources: discharges coming from a pipe leading directly into the water. Those major sources masked other water quality problems that are pervasive but harder to control. Now that large sources are better controlled, we are finding that our major problems are persistent chemicals in the environment and non point source pollution—pollution contained in runoff coming from the land.

Air Quality

In the past, Maine exceeded acceptable levels for particulates, sulfur dioxide, carbon monoxide, and ground level ozone. On the whole, control strategies have been successful in decreasing these pollutant levels across the state, except for ground level ozone in the southern counties.



While ozone formation is temperature dependent, there is a downward trend in the average number of days standards are exceeded

Ozone continues to be a serious air quality issue for Maine. Ground-level ozone can harm people, animals, buildings, and crops. It aggravates asthma and other chronic lung diseases. The precursors to ozone are emitted in automobile exhaust, gasoline and oil storage and transfer, and from common use of paint solvents, degreasing agents, cleaning fluids and similar materials.

While Maine has experienced a downward trend in the number of days federal limits for ozone are

exceeded each year, between 1980 and 1994, the number of self-reported asthma cases increased 75%. This suggests that work remains to be done. Current efforts are focused on reducing ozone formation from pollutants generated both in Maine and in upwind states.

Benzene

Air toxics are another serious public health concern. Benzene concentrations are used as an indicator for other hazardous air pollutants. Maine's goal is to decrease annual benzene concentrations in ambient air by 25% with a corresponding decrease in cancer risk. One of the primary sources of these chemicals is car exhaust and evaporation of gasoline during refueling. Technologically, we have made great strides in removing the pollutants from vehicle exhaust; cars built after 1996 are much cleaner. However, because we are driving our cars so much more, our environment has not realized the full benefits.

Greenhouse gases (carbon dioxide, nitrous oxide, methane and fluorocarbons) contribute to global warming. They are primarily emitted from transportation and generating electricity from fuel oil. Using alternative power sources could help reduce our role in climate change.



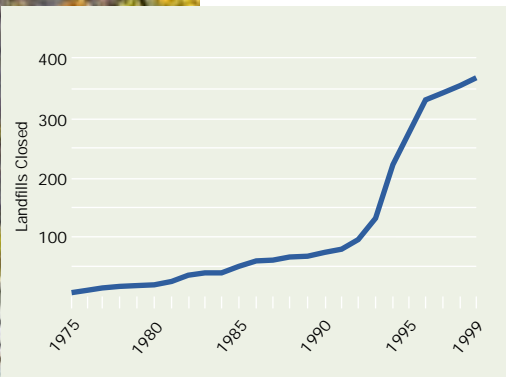
Benzene concentrations have declined

Waste and Remediation

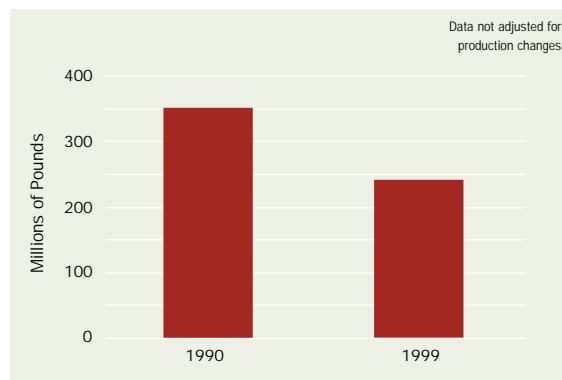
Landfills

Fifteen years ago, Maine's 402 municipal landfills posed substantial risks by polluting groundwater and surface water and creating a nuisance. With the guidance and support of the state, 371 of Maine's 402 town dumps have now been properly closed. Sixteen of the remaining 31 sites are inactive.

Another environmental success has been the removal and replacement of old, unprotected underground storage tanks. Maine has been a national leader in tank removal and containment requirements. However, technology does not ensure full protection of groundwater supplies; spills will happen. To guard against these impacts, Maine has enacted tough siting requirements that prohibit new tanks on our valuable sand and gravel groundwater aquifers or within close proximity to drinking water supplies.



Town dumps have been properly closed to upgrade solid waste management

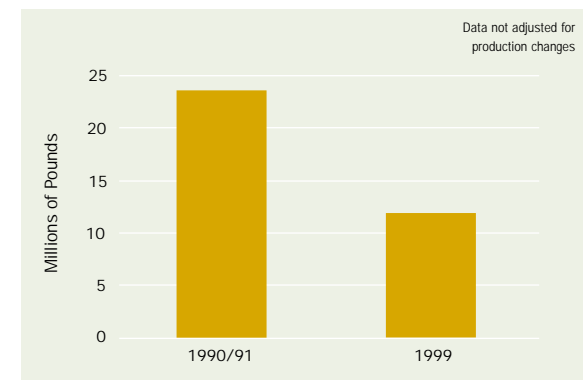


30% Decrease in use of extremely hazardous substances

Toxics

An important accomplishment of the past decade was a reduction in the use and release of toxic chemicals and in hazardous waste generation. All told, facilities have eliminated the use or generation of 120,000,000 pounds of toxic materials from Maine's environment *each year*. The first Toxics Use Reduction (TUR) law required businesses and state and federal facilities to reduce their use and release of toxic substances and their generation of hazardous waste. The law's reauthorization encourages further reductions and invites citizens to be involved in evaluating facility performance.

The law covers the use of extremely hazardous substances; chemicals that readily become airborne gases, vapors, mists or dusts and are very toxic to humans. The most commonly used in Maine are

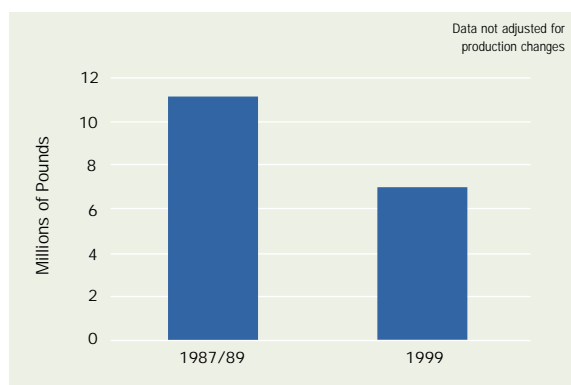


53% Decrease in toxic chemicals released

chlorine, ammonia and sulfuric acid. Use of these substances has been reduced by 31% since 1990.

Toxic chemical release has decreased by 53% in the same time period. These chemicals, 81 of which were used in Maine in 1999, have potentially acute human health risks, are carcinogenic, can damage the reproductive and nervous systems, and cause genetic mutations.

Generation of hazardous wastes declined by 37.5% between 1987/1989 and 1999. These nasty wastes are corrosive, ignitable, reactive, or toxic. Reducing or eliminating toxics and hazardous waste within a process rather than treating it at the end leads to a cleaner environment, a safer work place, and cost savings.



37.5% Reduction in hazardous waste generated

Tire Dumps

It was a grand dream — piles of tires stockpiled for the day when they would turn to gold. But that day did not come and a nightmare has ensued. Those huge piles of old tires became fire hazards, and provided places for mosquitoes to breed. Through five bond issues, Maine citizens have contributed \$9 million to clean up these stockpiles. Another \$2.1 has been dedicated from the State's Solid Waste Management Fund.

In 1996, DEP identified 318 sites across the state that contained 22.3 million waste tires. To date, over eleven million of those tires have been removed, chipped or used as fuel or fill. Only one of the five original million-plus tire stockpiles remains.

As one example of creative reuse, the tire chips were utilized at two new interchanges on the Maine Turnpike (exits 7A & 7B). Marine clay deposits underlying the soil required the use of a lightweight fill for the bridge approach embankments. Nine thousand tons of tire chips were used as fill, after being layered and wrapped in a geo-textile fabric underground. After a settling period, the interchange was constructed above them.



Land Use



Soil erosion is the single greatest threat to water quality

Land use greatly affects air and water quality as well as environmental integrity. Maine regulates major developments through the Site Location of Development and Stormwater Laws, and has good standards in place. Local governments also play a role in regulating smaller developments and land use.

We are now challenged by non-point source pollution from land uses and everyday activities of Maine citizens. These in turn continue to degrade surface and groundwater resources through polluted run-off.

Few people realize that soil erosion and stormwater are the primary sources of pollution to surface water in Maine. Erosion damages aquatic habitat and communities, river and stream structure and patterns,

and recreational values. Erosion also carries pollutants and extra nutrients into the water.

Maine has stringent sedimentation and control requirements at construction sites, but that's not enough. We need to create or maintain vegetated buffer zones along streams, rivers, and shorelines, and maintain roads, quickly reseeding or covering any soil that is left bare.

Consequently,. DEP is shifting its reliance from traditional engineering solutions to include more watershed management tools to address these problems. Reaching out to volunteer monitoring groups, and education and outreach efforts are vital components of a strategy to address problems linked to everyday activities.

Brownfields

Brownfields are abandoned, idled, or under-used industrial/commercial facilities with past environmental contamination, usually in urban areas. Cleaning up these sites addresses public health threats and encourages the reuse of urban areas that already have public infrastructure, slowing the rate of sprawl.

Maine's Voluntary Response Action Program (VRAP) promotes investigation, remediation and redevelopment of contaminated properties by offering liability assurances and protections from state enforcement actions. As of March 2002,

294 sites had applied to the program, with 239 sites issued final certification.

An example of a VRAP project is the Hodgdon Yachts facility in East Boothbay. The site was contaminated with "black beauty" blasting grit, which contains low levels of lead. The previous landowners had used the grit to remove paint from boats before repainting. Under VRAP, Hodgdon encapsulated the lead-contaminated grit underneath the foundation of the new facility and within the reconstructed shoreline, eliminating potential contact with the soil and mitigating risks. This allowed the redevelopment of an old boatyard.

The Changing Landscape: complex issues

Today, environmental issues are more complex than in the past and cannot be characterized in terms of their impact on a single resource. Our problems are interrelated and our choices have long-range impacts that are more subtle and harder to identify. We must look at environmental challenges with the broadest possible perspective to achieve the best results.



Energy Use and Mercury Contamination

Even heating our own homes involves choices and consequences. Mercury becomes airborne through burning coal, oil, wood or natural gas, incinerating mercury-containing garbage, and through industrial processes that use mercury. It drops out of the air with rain and snow, contaminating soils, lakes and streams. Mercury interferes with the developing nervous system of the human body and can decrease our ability to walk, talk, see, hear, and reproduce. It does not break down in the environment. Mercury levels in Maine fish, loons, and eagles are among the highest in North America—so high that Maine's loon population cannot currently sustain itself!

MTBE

MTBE (methyl-tertiary-butyl ether) boosts octane and makes gasoline burn more completely. In the mid 1990s, Maine started using fuel with higher MTBE levels to reduce air pollution. Air quality did improve, but another environmental problem emerged. MTBE easily reaches and contaminates

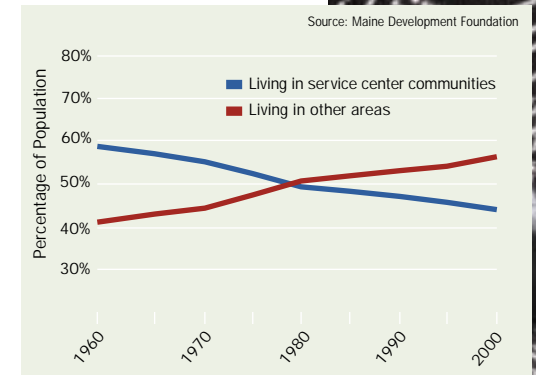
groundwater. The presence of MTBE in a significant number of Maine wells prompted the state to reconsider clean air strategies. Today's gasoline supply contains only very small amounts of MTBE.

Sprawl

Maine has used large-lot zoning to preserve open space and rural character. However, this has spread development over a wider area. Over the last 30 years, the fastest growing towns in Maine have been "new suburbs", 10 to 25 miles from service centers where we work and shop. These high-growth communities have accounted for virtually all of Maine's population growth. As we spread out and live in more rural areas, we create more air pollution from our cars, more lake degradation from development runoff, and more fragmentation of wildlife habitats.

Stormwater and Nonpoint Source Pollution

Rainwater filters through soils before reaching a river or lake so that the character of the land surrounding a river or lake affects its quality. When watersheds are altered to build houses and clear land we impair that natural filtering process. As the number of people living in each watershed increases, the number of contaminants in the watershed increases. In a developed watershed, water picks up salt, oil, gas, and lead from roads; pesticides and fertilizers from home gardens and landscaping; effluent from septic systems; and substances disposed of on the ground by homeowners.



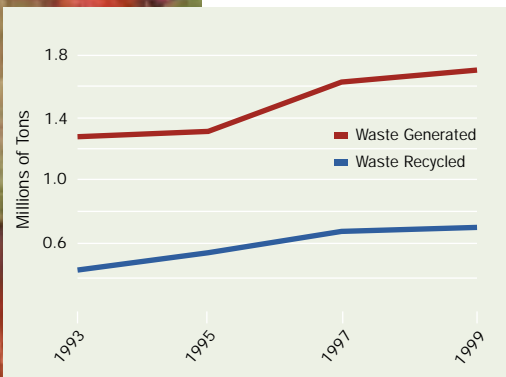
People are choosing to live in outlying areas rather than in service center communities

The Changing Landscape: shared responsibilities

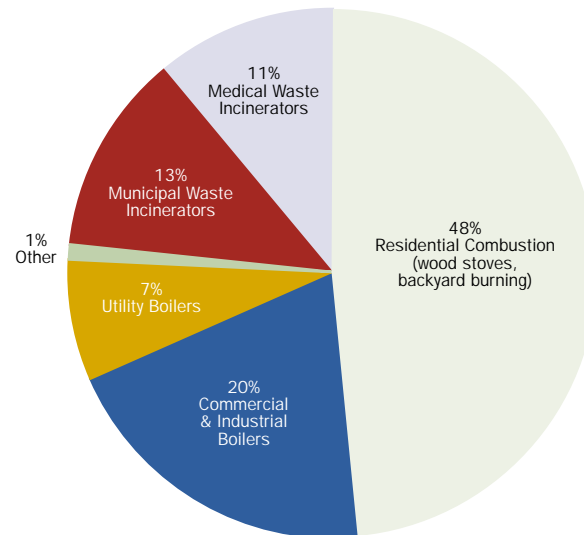
Surprisingly, the largest polluter on the landscape is the general public—ordinary individuals going about their daily lives. It is not one or two smokestacks or discharge pipes. Instead, the choices each one of us makes every day have the greatest impact on the quality of Maine's environment and landscape.

Solid Waste Generation and Recycling

Since 1993, Maine people have generated increasing amounts of solid waste on a per capita basis. While 40% of our waste stream is recycled, the fact remains that each one of us is generating more trash.



The amount of trash generated in Maine has increased despite recycling efforts



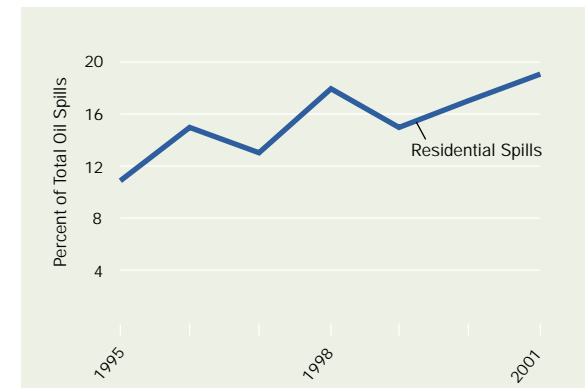
Backyard burning and woodstoves are the largest source of airborne dioxin

Dioxin

Burning trash in backyards or wood stoves is the largest source of dioxin emissions to Maine's air. PVC plastics are used in everyday packaging and products. When they are burned in small fires like burn barrels or campfires, dioxins and furans are formed.

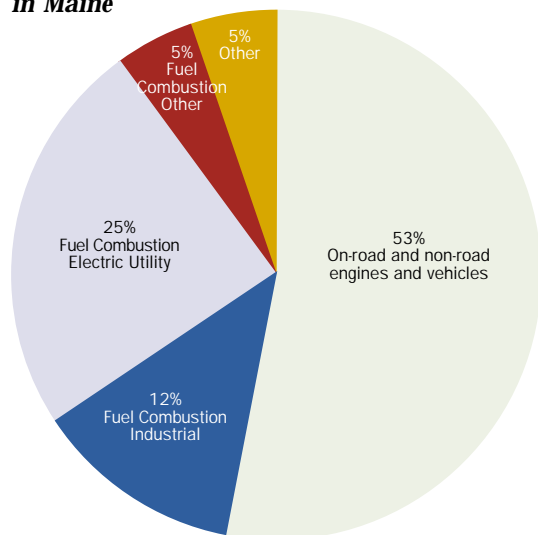
Residential Oil Spills

The percentage of oil spills coming from private homes is increasing and in 2001 accounted for nearly one in every five spills. Every day there is at least one spill from a home heating oil tank!



The percentage of oil spills coming from homes has increased

Cars are the largest source of NOx emissions in Maine



Mobile Sources

Nitrogen oxides (nitrogen dioxide and nitrogen oxide) are reactive gases that contribute to air quality-related health problems. Burning fuel in cars, trucks, power plants, and industrial sources produces NOx. In addition, nitrogen oxides combine with sulfur dioxide to form acid rain, and are precursors for ground level ozone. Nitrogen oxides also contribute to global warming.

The largest source of NOx is from cars and trucks—or mobile sources. Technology has decreased the amount of NOx emitted per mile by vehicles, but we have not seen the benefits of that reduction because we are driving more and more miles.

**Maine Interfaith Power and Light
(www.meipl.org)**

A group of faith-based organizations have banded together to purchase green power—electricity from renewable energy sources such as hydropower, solar power, wind power, and wood-fired generators. These organizations are looking for a way to make a direct positive impact on the environment and will purchase electric power that has the least adverse effect on the environment. Individuals also are invited to join the pool. To date, over 1,200 accounts are registered with the program through a non-binding letter of intent. Negotiations with potential green power suppliers are underway.

***It is no longer
big industry that is
the primary source of
our pollution problems.
It is all of us making
everyday choices.***



The Changing Landscape: today's challenges

Our greatest environmental challenges today involve individual responsibility and choices. We are faced with problems that government cannot and should not regulate. Regulations to protect the environment and public health are in place, and technology has stretched to fix many of our problems. But now it is our turn.

Invasive Aquatic Plants

Invasive aquatic plants (e.g. Eurasian watermilfoil and others) threaten to choke off the native plants and organisms in our lakes. It is illegal to introduce these plants to Maine lakes, but they become attached to boats, trailers and anchors. Unless we clean and check our boats, Eurasian watermilfoil could soon creep across the state.



Eurasian watermilfoil clinging to boat motors and trailers can inadvertently spread this invasive aquatic plant to Maine lakes



Waste Generation

The average amount of waste generated by each person has grown over the past decade, despite active recycling programs. Composting, recycling and being aware of packaging can help us all address this issue. Also, we will need to segregate certain components, like mercury-containing products, to reduce the toxicity of our household waste.

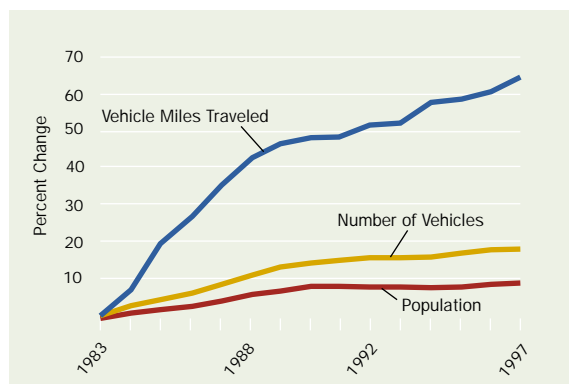
Soil Erosion and Stormwater

Soil from erosion and stormwater is the number one source of pollution to Maine's lakes and streams. When we change the landscape from forest to yards, streets, farm fields, shopping centers and roads, we accelerate erosion. Soil erosion damages water quality, increases sedimentation of our lakes and streams, and increases the pollutants in our waters. To reduce soil erosion, keep soil covered or plant buffers to catch the soil before it enters the water.



Sprawl and the Need for Cars

The rural character of our state and the spread out pattern of development make it necessary to drive a car. While cars are running cleaner than ever before, our air quality has not benefited because we are driving more and more miles each year.



The amount of driving in Maine has increased 60% while the population has remained stable

Increased Energy Use

Our use of nonrenewable energy sources contributes to greenhouse gases and air pollution. Renewable forms of energy are becoming available to reduce the emissions of green house gases.

Drive Green and Save Money

- Combine trips, commute with someone.
- Maintain your vehicle-ensure your engine is tuned, tires inflated and aligned, catalytic converter, gas cap and exhaust are working properly. You will reduce your fuel use and save money.
- Avoid high speeds. Driving at 55 mph rather than 65 mph will improve gas mileage by 15%.
- Avoid idling or engine warm-ups over 1 to 3 minutes.
- Take your ski rack or ski box off when not in use. It reduces your mileage substantially by increasing the drag on your car's roof.
- When buying a new vehicle, be an informed buyer and help improve Maine's air. Check the mileage rates for your new vehicle. If buying a used vehicle, look for certified low emission vehicles (LEVs and ULEVs).
- Recycle your motor oil safely.
- Dispose of anti-freeze carefully – recycle if possible.

(Adapted from "An Assessment of the Quality of Maine's Environment, 1998" by the MEPC)



Setting the Stage for Change

We are on the threshold of major changes in how we manage our environment and we need to adapt a new approach. Improvements in our environment won't come from just government-based regulatory efforts. The changes we need require us to take action.

- Be Engaged Become engaged in our government, ask the right questions, and demand appropriate actions. Many of our environmental laws are predicated on citizen involvement and action—the citizen's right-to-know law allows each of us to become aware of what chemicals are used and released in our towns.
- Reduce, Reuse, Recycle Stop resource depletion by not using the resources in the first place, reuse what you can and recycle the rest! Then... demand recycled products.
- Buy Smart! Vote through purchases and spending. Information gives us the tool to learn about the options and products we buy and about the practices and behavior of companies we invest in.
- Support Sustainable Practices Look for companies and products that use the notion of mimicking nature and not depleting our precious natural resources.

We have the ability to adopt practices that are more compatible with ecologically, socially and economically sustainable development. We can all be more active players in Maine's environment. The choice is ours.

Lakes Environmental Association

Citizen action can make a difference in the health of Maine Lakes. The Lakes Environmental Association is a private, non-profit organization founded in Naples, Maine over 30 years ago to protect the water quality and watersheds of the Sebago-Long Lake Region. The Association serves the towns of Bridgton, Denmark, Harrison, Naples, Sweden, and Waterford as well as Sebago Lake.

LEA makes lake protection a community affair. It does:

- Comprehensive water quality testing on 38 lakes including testing for acid rain and mercury.
- Advocacy for water quality and lake protection issues like watermilfoil.
- Technical assistance to local towns as they review proposed projects, enforce shoreline regulations, create ordinances and plan for future development.
- Educational initiatives in Maine's lakes region.
- Technical assistance to shoreland owners in preventing and correcting erosion and sedimentation problems.

LEA is 70% funded by membership contributions and is supported by 1100 members and businesses.



Dear Maine Citizens,

We are on the cusp of major shifts in how we address environmental problems. Over the past 35 years, we have built a regulatory framework that addressed gross problems in air quality, water discharges, waste disposal, and land use. That approach has served us well and we will always rely on the backbone of strict standards and enforcement.

But today we need more. Our land, resources, and the capacity to absorb wastes are in decline—we are reaching our environmental limits. Our future quality of life and health is a real concern.

Environmental regulation alone will not do the job. We need to make choices to restore, sustain, and expand our “natural capital”. The principles of natural capitalism provide a starting point for new innovative thinking about our environmental resources:

- Increase the productivity of natural resources through changes in production design and technology to stretch their use and save operational costs, capital investment, and time.
- Shift to biologically-inspired production models and materials; closed loop systems modeled on nature’s designs that enable the constant reuse of materials in closed cycles.
- Move to life-cycle practices or a service and flow business model, where consumers obtain services by leasing or renting goods rather than buying them outright. The incentives to develop durable products are then aligned with the rewards for resource productivity.
- Develop accounting systems that consider the cost of using and depleting our natural assets and resources while assessing the true cost of energy use and developing public infrastructure.

We have many challenges in the coming decades including global warming, public health risks, and resource depletion. Moving toward a more sustainable future requires adapting policies, institutions, technologies, and lifestyles as well as altering deep and enduring attitudes, values, and behaviors that underlie our economic and social systems.

We have the power to reconcile human affairs with the natural laws and thrive in the process. Maine’s Environment—the choice is ours....

Sincerely,

Martha G. Kirkpatrick
Commissioner, Department of Environmental Protection

The Maine Department of Environmental Protection is based in Augusta, and has three field offices. The Department is composed of an Office of the Commissioner, and three Program Bureaus: Air Quality, Land and Water Quality, and Remediation and Waste Management. Our website is www.state.me.us/dep/

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